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Diabetes Case Reports

Short Communication

## Therapeutic Strategies in Diabetic Nephropathy and Diagnosis

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### DESCRIPTION

Diabetic nephropathy Kidney disease caused by diabetes is the most common cause of renal failure. Almost one-third of diabetic patients develop diabetic nephropathy. People with diabetes and kidney disease are generally worse than those with kidney disease alone. This is because people with diabetes usually have other long-term conditions such as high blood pressure, high cholesterol, and vascular disease (atherosclerosis). People with diabetes are also more likely to have other kidney problems, such as bladder infections and nerve damage to the bladder. Pathophysiological abnormalities in diabetic nephropathy usually begin with prolonged poor control of blood sugar levels. Following some changes to the kidney, nephron filtering unit. First, especially nephrons become obsolete, and paradoxically, the adjustment of hyper filtration is delicate stress on the glomerular capillaries.

### Causes

Diabetic nephropathy develops slowly. According to one study, 15 years after being diagnosed with diabetes, one-third high levels of albumin in their urine. However, less than half of these people develop complete nephropathy [1]. According to statistics, kidney disease is rare in people less than 10 years old with diabetes. If there are no clinical signs of nephropathy 20 to 25 years after the onset of diabetes, it is less likely to develop thereafter. If a person with diabetes effectively controls his or her blood sugar levels, the chances of diabetic nephropathy are low. High blood sugar levels increase the risk of high blood pressure due to blood vessel damage [2]. High blood pressure, or high blood pressure, can contribute to kidney disease.

Vicious cycle of induced injury, further increase in proteinuria and blood pressure and additional nephron injury and decreased overall renal function. At the same time, there are changes in the glomerulus itself. This includes thickening of the basement membrane, enlargement of the slit diaphragm of podocytes, an increase in the number of mesangial cells, and an increase in the mesangial matrix [3]. This matrix invades the glomerular capillaries and produces deposits called Kimmelstiel-

Wilson nodules. Mesangial cells and matrices gradually expand and consume the entire glomerulus, which can interfere with filtration.

### Diagnosis

A specific blood test that looks for specific blood chemistry can be used to diagnose kidney damage. It can also be detected early by finding proteins in the urine. There are treatments that can help slow the progression of kidney failure. Therefore, if you have diabetes, you need to have a urine test every year. A specific blood test that looks for specific blood chemistry can be used to diagnose kidney damage. It can also be detected early by finding proteins in the urine. There are treatments that can help slow the progression of kidney failure. Therefore, if you have diabetes, you need to have a urine test every year [4].

### TREATMENT

**Reduced Cardiovascular Risk:** People with diabetes have a significantly increased risk of cardiovascular disease. It is also an independent risk factor for renal failure. Therefore, it is important to actively manage cardiovascular risk factors in diabetic patients, especially those with diabetic nephropathy. Key elements of cardiovascular disease treatment are tobacco discontinuation, hypolipidemic therapy (such as statins), regular exercise and a healthy diet. Atorvastatin is preferred over other statins in patients with renal disease because it does not require GFR-based dose adjustment [5].

**Glycemic control:** Several studies have found a positive effect on improving glycemic control on the clinical outcome of patients with diabetic nephropathy. Intensive glycemic control also reduces the incidence of other DM complications such as retinopathy and neuropathy. Glycemic control is primarily maintained by insulin in patients with type 1 diabetes and hypoglycemic agents and insulin in patients with type 2 diabetes. Studies have shown that a target HbA1c concentration of 7% reduces micro vascular complications in diabetic nephropathy. Further lowering of HbA1c is not recommended for most

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patients as it does not correlate with better outcomes and may therefore increase the risk of hypoglycemic episodes.

**Blood Pressure Control:** Several randomized clinical trials have shown the benefit of lowering systolic blood pressure to less than 140 mmHg in patients with diabetic nephropathy. Hypertension is associated with micro albuminuria, accelerated onset of hyper proteinuria, and decreased renal function. Angiotensin converting enzyme inhibitors and angiotensin II receptor blockers are especially useful in lowering blood pressure and slowing the progression of nephropathy in diabetic patients.

Maintain regular appointments for diabetes management. Maintain annual appointments, or more frequent appointments if recommended by the healthcare team, to monitor how well you manage your diabetes and screen for diabetic nephropathy and other complications. Treat your diabetes. Effective treatment of diabetes can prevent or delay diabetic nephropathy. Manage high blood pressure and other medical conditions. If you have other symptoms that increase your risk of high blood

pressure or kidney disease, work with your doctor to manage them. Follow the instructions for over-the-counter medications.

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## Stem Cell Therapy of Diabetes Mellitus

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### DESCRIPTION

Stem cell therapy holds great promise for the treatment of diabetics. Studies on the ability of human embryonic stem cells to differentiate into islet cells define the developmental stages and transcription factors involved in this process. However, the clinical application of human embryonic stem cells is limited by ethical concerns and the potential for teratoma formation. As a result, alternative forms of stem cell therapy such as induced pluripotent stem cells, umbilical cord stem cells, and bone marrow-derived mesenchymal stem cells have become an intensive research area. Recent advances in stem cell therapy have the potential to make this a viable treatment for diabetes in the near future. Diabetes is one of the most prevalent metabolic disorders. Islet cell transplantation is the most common treatment to replace the function of pancreatic beta cells destroyed by diabetes. However, there are some restrictions. Alternatively, Human Pluripotent Stem Cells (hPSCs) may provide an unlimited source of pancreatic cells capable of secreting insulin in response to hyperglycemic levels. However, the determination of suitable candidate pancreatic strains for cell therapy to treat diabetes remains controversial. Although hPSC-derived beta cells are considered the ultimate candidate, their efficiency needs to be further improved in order to obtain a sufficient number of glucose-responsive beta cells for transplantation therapy. On the other hand, hPSC-derived pancreatic progenitor cells are efficiently produced in vitro and may further mature into glucose-responsive beta cells in vivo fertilization after transplantation.

Clinical pancreas or islet transplantation has been considered a feasible treatment option for T1DM patients with poor glycemic control. Until now more than 50,000 patients worldwide had received pancreas transplantations according to the International Pancreas Transplant Registry (IPTR). It was reported that seven consecutive patients with type 1 diabetes attained sustained insulin independence after treatment with glucocorticoid free immunosuppression combined with the infusion of adequate islet mass. This treatment known as the

Edmonton protocol. Over the last two decades, continuous improvement in islet isolation and immunosuppression has increased the efficiency of islet transplantation, with approximately 60% of T1DM patients achieving insulin after islet transplantation.

### Stem cells in the treatment of diabetes

The researchers collected and analyzed 13 studies published between 2006 and 2016. These include 342 patients who received cord blood-rich stem cells and 111 patients who received cord blood-rich stem cells. Not everyone responded to treatment, but researchers observed improved glucose control and decreased insulin dependence that lasted up to four years. The results were promising for the treatment of diabetes with stem cells, but some were the ideal candidates were the optimal route of administration, optimal dose, and whether multiple transfusions were needed.

The etiology of DM, whether type 1 or type 2, can be due to dysfunction of pancreatic beta cells. There are approved therapies that improve the function of beta cells, but none result in the regeneration of lost or dysfunctional beta cells. Studies have shown that beta cells can be reprogrammed with specific molecules such as GABA and hormones. However, these studies also reveal many uncertainties that need to be investigated. Stem cells for the treatment of DM come from a variety of biological sources such as embryos, placenta, and bone marrow. Progenitor cells are another exciting area of research. Like stem cells, these cells can take the form of various types of mature human cells, but unlike stem cells, they cannot divide indefinitely.

Precursor stem cells were used to proliferate insulin-producing cells from enterocytes and immature pancreatic cells under laboratory conditions. This article outlines the different approaches to regenerating the pancreas in diabetics, recent advances, including our contributions, and new approaches that may be explored in the future.

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# The Analysis of Blood Glucose Regulation of Diabetes Mellitus and its Diagnosis

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## DESCRIPTION

Blood glucose stage is regulated through more than one pancreatic hormones, which alter it through one of a kind pathways in ordinary and bizarre situations through expressing or suppressing more than one genes or molecular or cell targets. Multiple artificial pills and healing procedures are used to treatment glucose regulatory problems, even as a lot of them are used to treatment different health issues, which arise due to disturbance in blood glucose regulations. Many new techniques and approaches are used for the improvement of phytochemicals primarily based totally pills to treatment blood Glucose Law Problems (GLP), and a few of the compounds had been remotest and recognized to treatment insulin resistance or alter beta cellular feature or glucose absorption withinside the guts or GLP-1 homoeostasis or two/extra pathways (e.g., both treatment hyperglycemia or improve insulin resistance or treatment pancreatic beta cellular regeneration or augmentation of GLP-1, manufacturing of islet cellular, manufacturing and expanded insulin receptor signaling and insulin secretion or reduced insulin tolerance or gluconeogenesis and insulin-mimetic motion or manufacturing of  $\alpha$ -glucosidase and  $\alpha$ -amylase inhibitor.

## Pathways involved to regulate blood glucose levels

Pancreas secretes insulin and glucagon. Both hormones work in balance in regulating blood sugar levels. The basic functions of insulin and glucagon are to maintain glucose homeostasis. In between the meals, during fasting, exercise or hypoglycemia, glucagon and epinephrine are released into the blood. Along

with this, glucagon has hepatic and renal gluconeogenesis and growth endogenous blood glucose stages. In expanded exogenous glucose stages, after a meal, Insulin enhances glucose uptake and metabolism in the cells, thereby reducing blood sugar level. This transporter is controlled by insulin and causes the uptake of blood glucose in particular into muscle cells. Moreover insulin complements glycogenesis, lipogenesis and incorporation of amino acids into proteins; hence it plays its anabolic motion compared to glucagon that is catabolic. Along with pancreas, different organs additionally adjust blood glucose stages.

## DIAGNOSE

In Fasting blood glucose test doctors test your blood glucose levels after 8 hours of fasting, which is above 126 mg / dl.

## Oral glucose tolerance test

After 8 hours of fasting, you will be given a special sweet drink. After 2 hours, your blood sugar will exceed 200. Whereas in random check doctor will test your blood sugar level, which is over 200, more urinating, you are always thirsty, and you gain or lose a significant amount of weight. They then perform a fasting blood glucose test or an oral glucose tolerance test to confirm the diagnosis. Higher sugar content than normal is unhealthy. Levels that are higher than normal but have not reached the point of full-blown diabetes are called prediabetes. Your body uses glucose for energy. Glucose metabolism requires insulin, a hormone produced by your pancreas.

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Diabetes Case Reports

Commentary

## Importance of Diabetic Retinopathy and Its Significance

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### DESCRIPTION

Diabetic retinopathy is a complication of diabetes that affects the eyes. This is caused by damage to the blood vessels in the photosensitive tissue (Retina) behind the eye. Initially, diabetic retinopathy may cause no symptoms or only mild visual impairment. However, it can lead to blindness. This condition can occur in anyone with type 1 or type 2 diabetes. The longer you have diabetes and the less control you have in your blood sugar, the more likely you are to develop this eye complication. If you have diabetes, it is important to have a comprehensive magnified eye exam at least once a year. Diabetic retinopathy may be asymptomatic at first, but early detection can help protect your eyesight. Managing diabetes by keeping your body active, eating a healthy diet, and taking medications can also help prevent or delay vision loss.

### Causes and risk factors

Diabetic retinopathy results from the damage that diabetes causes to the small blood vessels of the retina. These damaged blood vessels can lead to loss of vision:

Fluid can leak to the macula, an area of the retina that causes clear central vision. Although small, the macula is part of the retina and you can see the colors and details. The fluid causes the macula to swell and cause vision problems.

New blood vessels can be formed on the surface of the retina to improve blood flow to the retina. These fragile, abnormal blood vessels can leak blood behind the eyes and impair vision.

All people with diabetes are in danger of extinction-people with type I diabetes and type II diabetes. People's having diabetes for long time and

the risk of developing eyepieces is high. Diagnosed diagnostic diagnosed Americans 40 to 45 percent have several diabetic retinopathy. After 20 years of diabetes, 60% of the patients with almost all patients with type I diabetes and type II diabetes have the degree of retinopathy. A clear blood glucose threshold between high risk and low risk of diabetic retinopathy was adopted. The price listed is the proposed explanation, the difference between the research method, and the price of the prevalence in place of the incident value. During pregnancy, diabetic retinopathy may be a problem for diabetic women. National Institutes of Health (NIH) recommends a comprehensive eye examination for all pregnant women with diabetes.

### Diagnosis of diabetic retinopathy

Drops are placed in the eye to dilate (enlarge) the pupil. This allows the ophthalmologist to see inside the eye through a special lens. Doctors can perform Optical Coherence Tomography (OCT) to get a closer look at the retina. The machine scans the retina and provides a detailed image of its thickness. This helps doctors find and measure macular swelling.

Fluorescein angiography or OCT angiography helps doctors see what is happening to the blood vessels in the retina. Fluorescein angiography uses a yellow dye called fluorescein that is injected into a vein (usually the arm). The dye travels through the blood vessels. A special camera takes a picture of the retina as the dye passes through the blood vessels. This indicates whether the blood vessels are clogged or fluid is leaking. It also indicates whether abnormal blood vessels are growing. OCT angiography is a new technique that does not require dyes to observe blood vessels.

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Diabetes Case Reports

Opinion Article

## Advances and Risk Factors in Diabetes Mellitus

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### DESCRIPTION

Diabetes is a disease that occurs when your blood sugar (also known as your blood sugar) is too high. Blood sugar is the main source of energy and comes from the food you eat. Insulin, a hormone produced by the pancreas, helps glucose from food enter cells and be used for energy. Sometimes your body does not produce enough or no insulin, or does not produce as well. After that, glucose stays in the blood and does not enter the cells. Over hours, too much glucose in the blood can cause health problems. There is no cure for diabetes, but there are steps you can take to manage and stay healthy. There are three main types of this disease i.e. Type 1, type 2, gestational diabetes. With all three, your body cannot make or use insulin.

### Risk factors

Type 2 diabetes is the most common form of diabetes. In Type 2, the body can still produce some insulin, but the hormones cannot be used as effectively as they should. Insulin normally allows cells to ingest glucose. However, cells are less sensitive to insulin and can have higher blood sugar levels. If your blood sugar is consistently high, you may have type 2 diabetes. Elevated blood sugar levels can damage the body. Type 2 diabetes often goes through a stage called prediabetes.

At this stage, the progression of the disease can be reversed through a healthy lifestyle. Unlike type 1 diabetes, type 2 diabetes is often treated with oral non-insulin medications. However, if type 2 diabetes does not respond to these options, insulin injections may still be needed. There are two risk factors for type 2 diabetes. In other words, what one can and cannot avoid.

Several factors that increase the risk of diabetes are inherited from our parents or close relatives. If you have a relative with diabetes, your risk of developing diabetes is significantly increased. Share your family's medical history with your doctor to find out what this means for you. The older you are, the higher your risk of prediabetes and type 2 diabetes. Type 2 diabetes generally occurs in middle-aged adults, most commonly after age 40. However, medical professionals have diagnosed an increasing number of children and adolescents with type 2 diabetes. If you develop diabetes during pregnancy, you are at increased risk of developing diabetes again in later years.

If you are overweight, you can take steps to prevent or delay type 2 diabetes by losing weight, reducing calories, and energizing your body. Talk to your doctor about any of the above health issues that may require medical attention. Addressing these health problems can help reduce your chances of developing type 2 diabetes. Also, talk to your doctor about any medications you are taking that may increase your risk.

Diabetes can cause serious health problems such as heart disease, stroke, and eye and foot problems. Prediabetes can also cause health problems. Fortunately, type 2 diabetes can be delayed or prevented. The longer you have diabetes, the more likely you are to have health problems. Therefore, delaying diabetes for several years can help your health. You can prevent or delay type 2 diabetes by losing a small amount of weight, following a low-calorie diet, and being physically active on most days of the week. The sooner diabetes is detected, the sooner treatment can be started and complications can be reduced or prevented. If a blood test reveals that you have prediabetes, you and your medical professional may work together to make lifestyle changes (weight loss, exercise, a healthy diet, etc.) to prevent or prevent the development of type 2 diabetes.

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